

What is Claimed Is:

1. A method in a host channel adapter, the method comprising:  
determining an order of received work queue entries based on respective service levels, and  
outputting the received work queue entries according to the determined order;  
generating, in a transport service module for each of the received work queue entries according  
5 to the determined order, a corresponding transport layer header for corresponding transport data  
specified by each of the received work queue entries;  
generating transmit packets in the determined order and having the respective transport layer  
headers; and  
outputting each of the transmit packets based on the determined order.
2. The method of claim 1, wherein the determining step includes:  
storing the received work queue entries in a work queue entry FIFO, each work queue entry  
specifying the corresponding service level;  
assigning each received work queue entry stored in the work queue entry FIFO to a  
5 corresponding selected one of a plurality of virtual lane FIFOs based on a prescribed service level-  
virtual lane mapping; and  
selectively outputting work queue entries from an identified one of the virtual lane FIFOs  
based on a determined priority of the corresponding prescribed service level.
3. The method of claim 2, wherein the selectively outputting step includes accessing a  
virtual lane arbitration table to determine the priorities for the respective virtual lane FIFOs.
4. The method of claim 2, wherein the virtual lane FIFOs include an embedded processor  
virtual lane FIFO for embedded processor operations, the selectively outputting step including granting  
priority to the embedded processor virtual lane FIFO over the remaining virtual lane FIFOs.
5. The method of claim 1, further comprising:  
storing, in a queue pair setup FIFO, queue pair commands received from a communication  
agent; and  
updating a queue pair attributes database based on the received queue pair commands.

6. The method of claim 5, further comprising generating in the transport service module a management frame based on identifying a queue pair command specifying a transport service management operation.

7. The method of claim 5, wherein the step of generating a transport layer header includes accessing the queue pair attributes database for transport layer header information.

8. The system of claim 1, further comprising:  
generating a header pointer that identifies a stored location of the corresponding transport layer header; and

5 outputting to a post-link module a packet request that specifies the header pointer and a corresponding payload pointer that specifies a stored location of the corresponding transport data.

9. A host channel adapter comprising:  
a pre-link module configured for determining an order of received work queue entries based on respective service levels, the pre-link module outputting the received work queue entries according to the determined order;

5 a transport service module configured for generating transport layer headers for the work queue entries output from the pre-link module according to the determined order; and

a post-link module configured for generating, in the determined order, transmit packets having the respective transport layer headers for output onto a network.

10. The apparatus of claim 9, wherein the post-link module outputs the transmit packets on respective assigned virtual lanes based on a determined availability of respective flow control credits.

11. The apparatus of claim 9, wherein the pre-link module includes:  
a work queue entry FIFO configured for storing the received work queue entries;  
a pre-link process module configured for mapping each of the received work queue entries stored in the work queue entry FIFO to a prescribed virtual lane based on the corresponding service  
5 level;

a plurality of virtual lane FIFOs, each configured for storing work queue entries assigned to the corresponding virtual lane; and

a virtual lane arbitration module configured for selectively outputting the work queue entries stored in an identified one of the virtual lane FIFOs based on a determined priority of the  
10 corresponding prescribed service level.

12. The apparatus of claim 11, wherein one of the virtual lane FIFOs is configured for storing work queue entries generated by an embedded processor, the virtual lane arbitration module granting priority to the one virtual lane FIFO.

13. The apparatus of claim 9, wherein the transport service module includes:  
a queue pair attributes database configured for storing attributes of established queue pairs;  
and  
a queue pair attributes management module configured for updating the queue pair attributes  
5 database based on received queue pair commands, and generating the transport layer header based on accessing the queue peer attributes database.

14. The apparatus of claim 13, wherein the queue pair attributes management module outputs to the post-link module a packet request that includes a header pointer specifying a stored location of the corresponding transport layer header, and a corresponding payload pointer that specifies a stored location of the corresponding transport data.